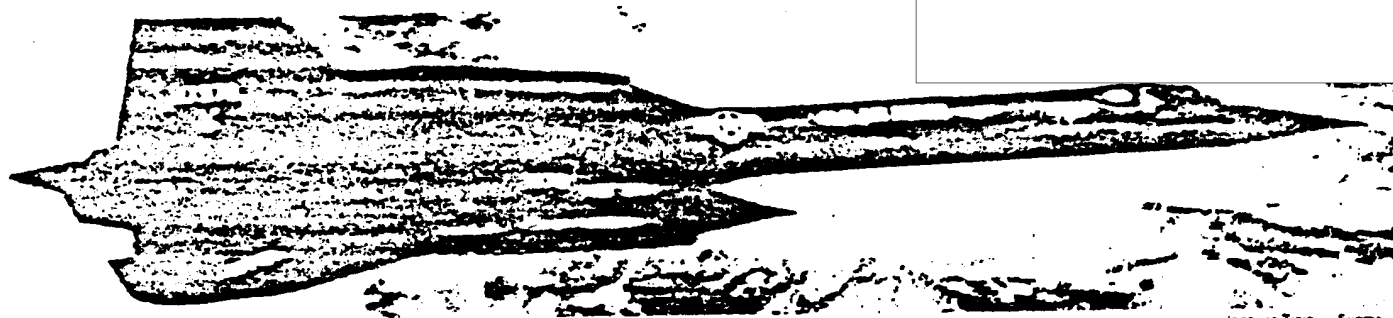


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JACQUES TURDOU—Sygma

An American SR-71 spy plane: Watching for arms-control violators with a star-wars array of satellites and electronic snooping gear

Keeping Everybody Honest

Arms control keeps snagging on the same issue: verification. The word is abstract but the problem is simple—neither the United States nor the Soviet Union trusts the other to keep a deal. To make sure that no one cheats, both countries have deployed a star-wars array of snooping gear. Pentagon officials joke that their satellites can read the license plate of a Volga from 100 miles up or tell which Russian soldiers shaved each morning. But the hardware alone can't keep nuclear superpowers honest and mankind safe. Both sides must at least trust the other to come clean if it gets caught cheating. "We can know from our observations when a new, puzzling gadget of some sort shows up in Siberia," says former CIA director William Colby. "Without a treaty we can ask indignantly what it is, and they will tell us as indignantly it is none of our business."

The easiest and best way to verify compliance is on-site inspection of production facilities, missile sites and testing grounds. But that is not going to happen: the Soviets have flatly refused to allow it, and the Pentagon is wary of allowing communists into America's secret sites. Verification of a START agreement will likely be left to "national technical means," which include an arsenal of supersophisticated snooping devices:

- **The KH-11 Digital Imaging Satellite.** At least two of these U.S. reconnaissance satellites are aloft at all times, circling the earth at altitudes between 170 and 300 miles. They have fuel for two years—and the space shuttle's tanker capacity will probably first be used to refuel one of them. The satellites' sweeping scans are instantaneously transmitted as a series of electric impulses, arriving at earth as multispectral images in several bands of visible and infrared light.

- **The Big Bird Satellite.** The KH-11's predecessor, it flies at an altitude of 100 to 200 miles and uses old photographic techniques. Film is developed on board and a TV-scanned image of the photograph is transmitted back to earth. The pictures are exceptionally sharp and are used for details on specific targets.

- **The Close Look Satellite.** It comes down to only 80 or 90 miles, photographing ground details. The satellite then jettisons the film over the Pacific; as it floats down on a parachute, a plane catches the film in the air with a special hook.

- **The Chalet Satellite.** A geosynchronous satellite, it turns with the earth every 24 hours, so it stays over one spot. It collects much-desired Soviet telem-

details of rocket performance during Russian tests.

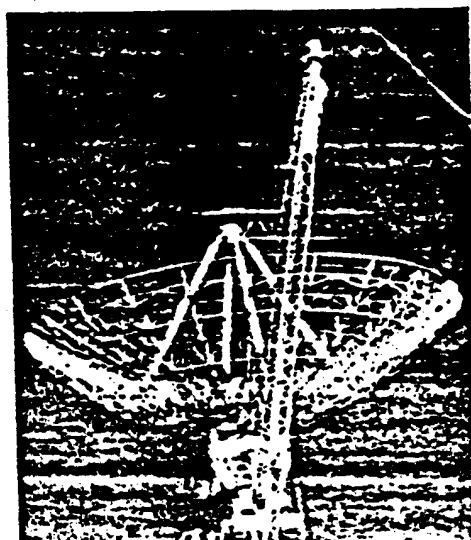
High-flying intelligence aircraft—the SR-71, U-2 and TR-1—are constantly snapping pictures. There are also two new snooping stations on the ground in China which monitor ICBM tests and have more than made up for the loss of installations in Iran. The monitoring devices are sophisticated enough that when the Soviets tested an SS-18 missile with 12 warheads instead of the usual 10, U.S. intelligence sensors advised against alarm: two of the warheads were decoys.

Relying on those technical means, the verification procedures of SALT I appear to have worked. A Soviet-American group called the Standing Consultative Commission meets every six months to privately discuss alleged violations of the treaty. Washington has often brought complaints to the SCC, and the Soviets have repeatedly either stopped what they were doing or explained their actions. In the mid-1970s, the Soviets complained that the United States had concealed some Minuteman silos in Montana, in violation of the treaty. The Air Force denied the charge at first, but then discovered that technicians working on nose cones had protected themselves from below-zero temperatures by draping canvas over their scaffolding—which did conceal the silo covering. The United States removed the canvas, cleared up the violation—and got a lesson in the sophistication of the Soviets' own reconnaissance satellites.

A Verification Nightmare: But the problems of verification get more serious every day. Under SALT, both sides agreed not to use hard-to-break codes for their telemetry signals, so that they could be sure that rocket tests did not violate the agreements.

But the Russians are encoding more and more of their telemetry, making it impossible for the United States to determine facts such as how many warheads were carried aboard a test-fired rocket. The Soviet ability to put more and more warheads on their missiles makes it increasingly difficult to monitor the number of bombs. And America's new cruise missiles will be a verification nightmare: they are small and portable, and it is impossible to tell whether they are armed with nuclear or conventional warheads. "We must be certain that we do not let our agreements get too far ahead of our verification capability," says Sen. John Glenn. But unless Moscow and Washington move fast, new technology could complicate verification enormously—and put an arms-control agreement all but out of reach.

An Air Force tracking antenna: Few secrets



JOHN BRECHER with JOHN J. LINDSAY
Washington